Equipment & Materials Processing

Shoka Denko restructures

Under its medium-term consolidated business plan (the Sprout Project), Showa Denko K.K. (SDK) has brought together its Electronics Materials and Rare Earth divisions at Chichibu. With this consolidation, SDK aims to strengthen its electronics business by assigning substantial resources to it.

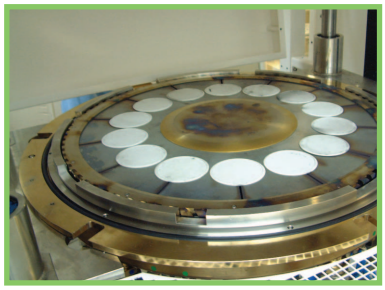
Following the consolidation, the newly formed Electronics Materials Division will improve facility maintenance and TPM (Autonomous Maintenance) activities to enhance production efficiency at Chichibu.

DARPA takes AIN for SUVOS program

DARPA has selected AIN substrate manufacturer Crystal IS Inc to participate in its Semiconductor Ultraviolet Optical Sources (SUVOS) programme.

Dr. Jon Whitlock, CTO at Crystal IS, said: "Single crystal native AIN substrates have the potential to enable the fabrication of high performance deep UV optical sources such as those sought under the SUVOS program." He continued: "Record low dislocation densities, coupled with excellent matches in crystal structure, lattice constant, and thermal expansion coefficient, make native AIN substrates an excellent choice for such applications. Current efforts to improve substrate size and uniformity and to better understand the role of impurities, if successful, bode extremely well for the development of cost-effective sensors based on deep UV optical sources."

EMF, Cree and Saturn



Saturn's 14 x 3" wafer capacity.

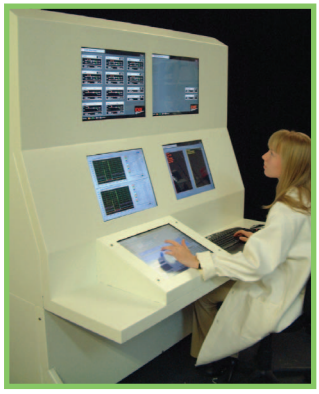
EMF the Cambridge-based epi equipment and specialist chemicals company took its newest, really big, really controlled production machine, Saturn, for its first public airing to the July Conference on Crystal Growth and Epitaxy. This with the workshop on OMVPE and the Laser and NLO Materials symposium was held in Keystone, Colorado.

What may make this US launch more intriguing than many realise is that EMF appears now to have the approval of a quiet, if major player as an interested investor.

Five years ago EMF set up EMF Ireland near Cork, attracted by the tax breaks offered to manufacturing companies. If Saturn were attractive to the compound-manufacturing brigade, Ireland would obviously be a good European site to assemble machines.

In the handwritten Annual Return of 2002 for EMF Ireland (held at Companies' House in Dublin and now searchable on-line), a Durham, NC, holding company sharing Cree's address has taken up 2,469 'O' shares in the Irish company. But both EMF and Cree politely decline to respond. Cree however has expressed considerable interest in SiC recently, acquiring the SiC power patent protfolio of Asea Brown Boveri (ABB Group).

More is to be had then from focusing on Saturn, with a pedigree that originates with the Mercury horizontal cell MOCVD tool for R&D systems



RC2 the closed loop reactor control centre.

but is much more closely based on the second generation Titan, only launched in January this year with its real time control. To produce a machine like Saturn - a big, bold mass production unit, which handles from 2"-4" wafers and works on quantities as high as 14 x 3" wafers, geared for GaN, SiC, AlGaN and InGaAs suggests that more may lie behind the launch than the simple airing of a quickly developed next generation mass production MOCVD tool.

Saturn, with vectored flow epitaxy, boasts that vital feature of real time control. Its reactor control centre allows interactive feedback within the closed loop control. Although obviously most epi systems collect data on production processes and yield, this is historic information, taking time to study and implement. Control and dynamic response to the main changing parameters within the Saturn process, real time abilities must lead to better, optimised yields, ideal for mass production which at present seems only to be demanded from the LED community. Interesting.

Emcore's MOCVD production seminar

This year's International Conference on Nitride Semiconductors (ICNS-5) saw a gathering of GaN experts discussing their work. Representatives from companies and Japanese universities specialising in nitride production attended a series of lectures providing insight into research and commercial developments in GaN processing.

Professor Suzuki, from the Nippon Institute of Technology, focused on GaN FETs, MOCVD growth on 1 degree misoriented sapphire substrates, and the growth of crack-free GaN films on Si substrates, in a technical presentation examining the results achieved using an Emcore D125GaN tool.

Emcore's staff scientist Dr. David Gotthold discussed his work on large area GaN growth, including production development for FETs on 3" (75mm) SiC and 4" (100mm) Si substrates.

Further presentations considered the future market potential for nitride devices and the latest GaN deposition products, including Emcore's Pioneer 75 reactor, a tool specifically designed for research applications.

Emcore is planning future MOCVD seminars in China, Europe, and the US.